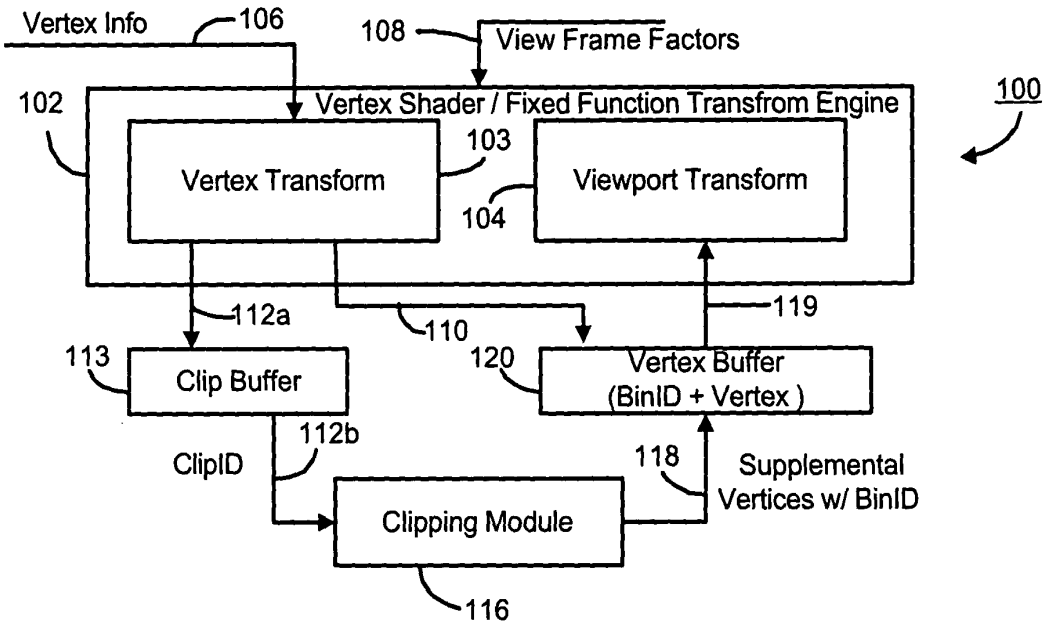
Vertex Info
106
108
View Frame Factors
102
Vertex Shader / Fixed Function Transfrom Engine
100
Vertex Transform
103
Viewport Transform
104
112a
110
119
113
Clip Buffer
120
Vertex Buffer
(BinID + Vertex)
112b
ClipID
118
Supplemental
Vertices w/ BinID
Clipping Module
116

FIG. 1

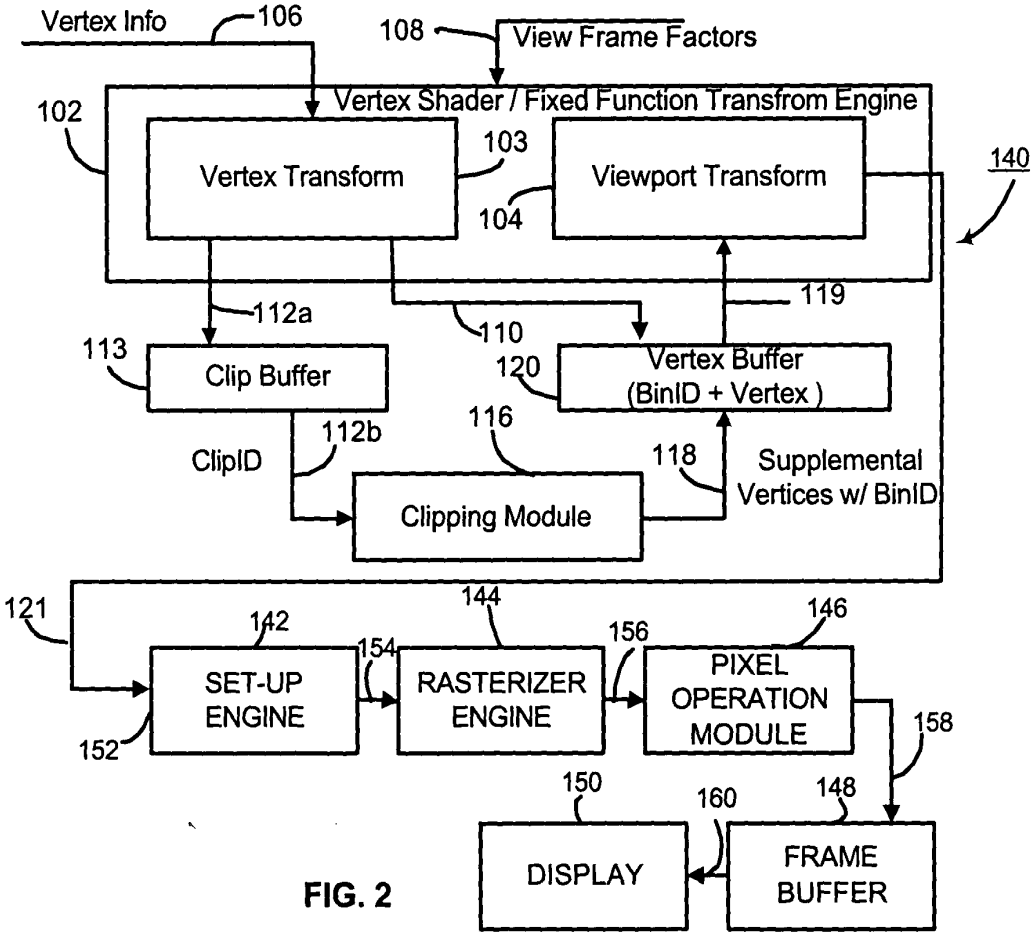
Vertex Info
106
108
View Frame Factors
102
Vertex Shader / Fixed Function Transfrom Engine
140
Vertex Transform
103
Viewport Transform
104
112a
110
119
113
Clip Buffer
120
Vertex Buffer
(BinID + Vertex)
116
112b
ClipID
118
Supplemental
Vertices w/ BinID
Clipping Module
121
142
144
154
156
146
SET-UP
ENGINE
RASTERIZER
ENGINE
PIXEL
OPERATION
MODULE
158
152
150
160
148
DISPLAY
FRAME
BUFFER

FIG. 2

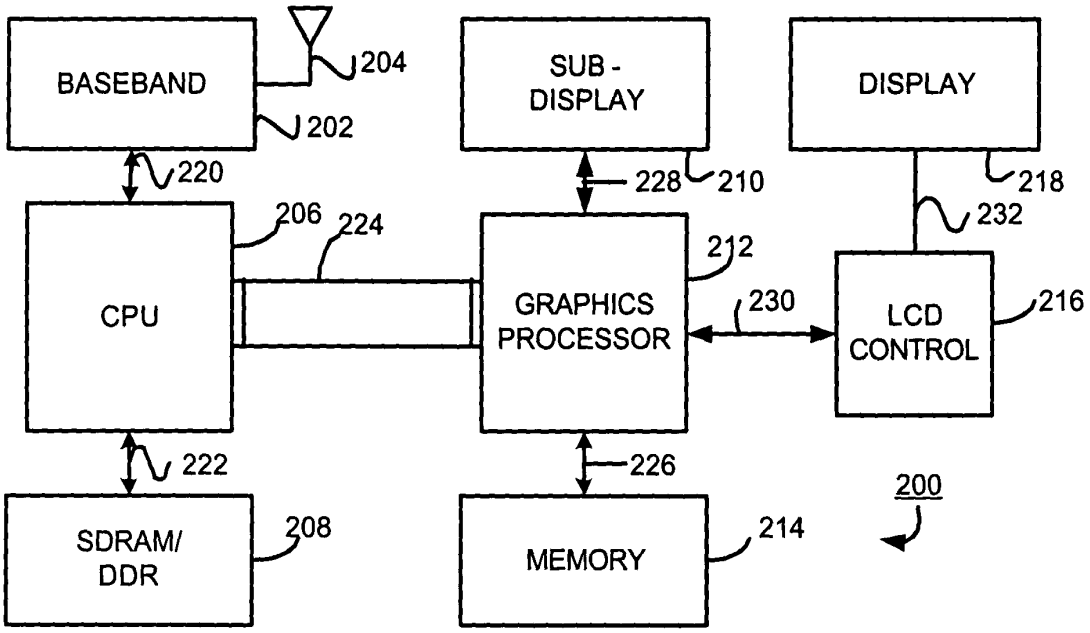

FIG. 3

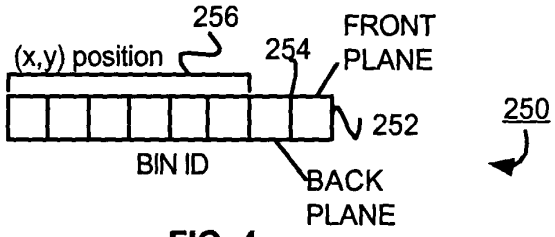

FIG. 4

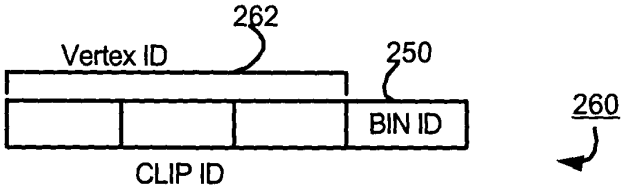

FIG. 5

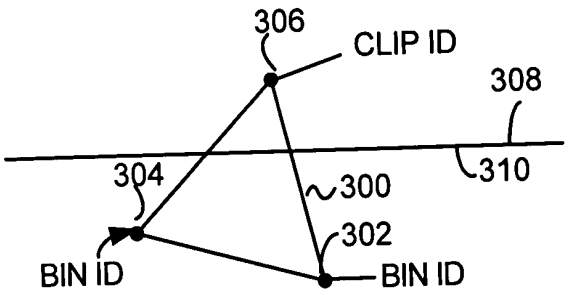

FIG. 6

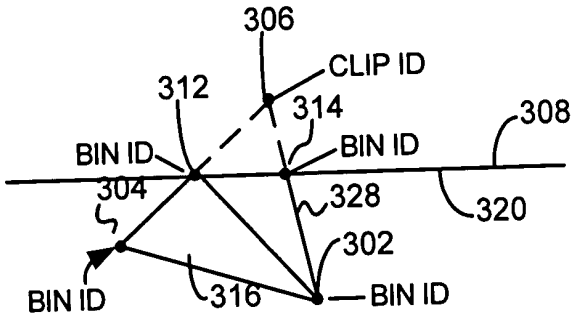

FIG. 7

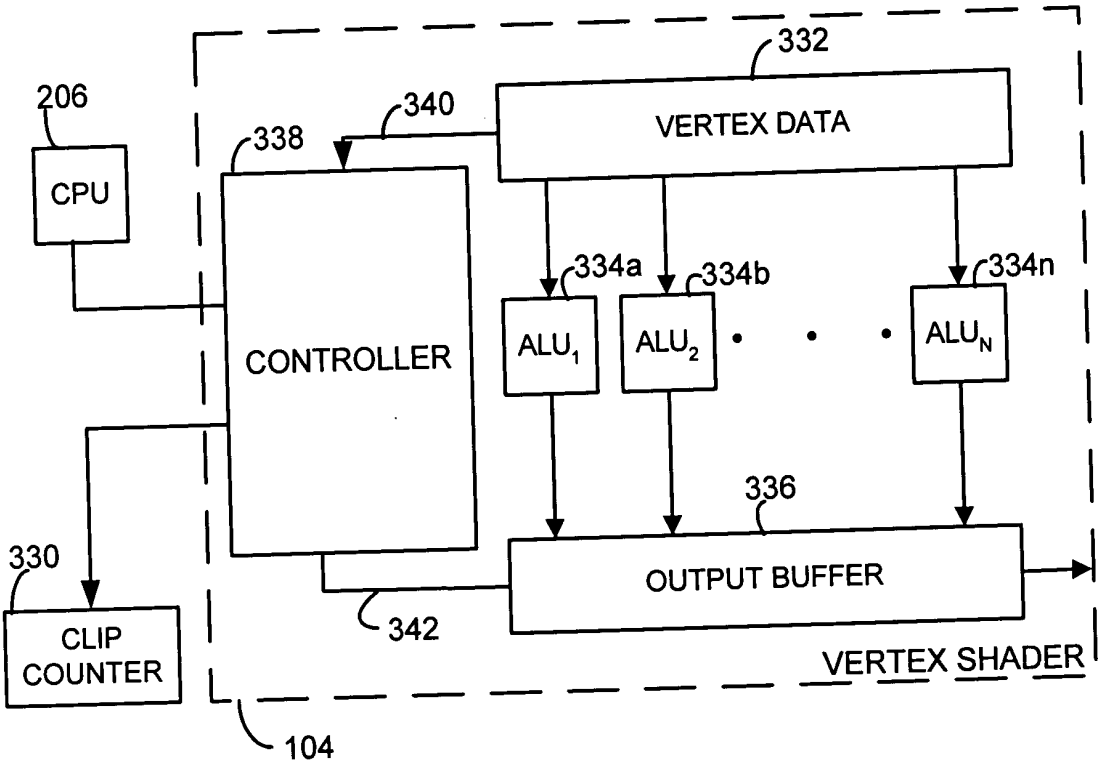

FIG. 8

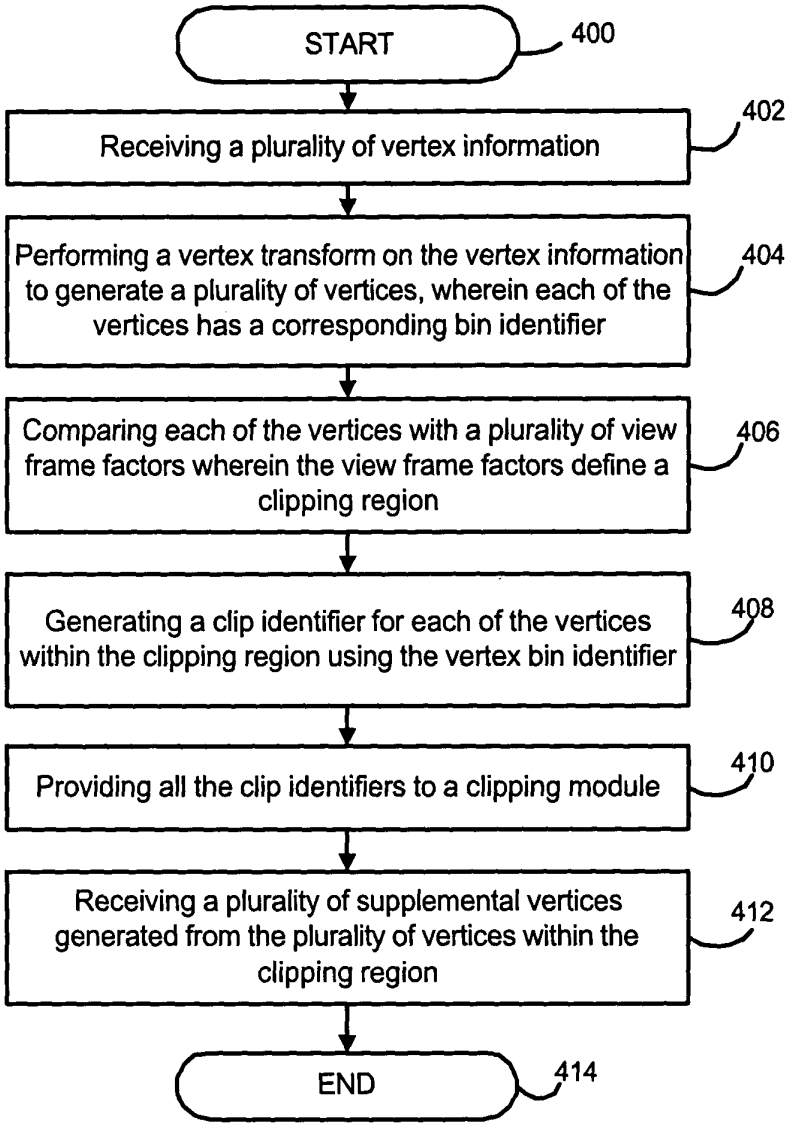
START
400
Receiving a plurality of vertex information
402
Performing a vertex transform on the vertex information to generate a plurality of vertices, wherein each of the vertices has a corresponding bin identifier
404
Comparing each of the vertices with a plurality of view frame factors wherein the view frame factors define a clipping region
406
Generating a clip identifier for each of the vertices within the clipping region using the vertex bin identifier
408
Providing all the clip identifiers to a clipping module
410
Receiving a plurality of supplemental vertices generated from the plurality of vertices within the clipping region
412
END
414

FIG. 9

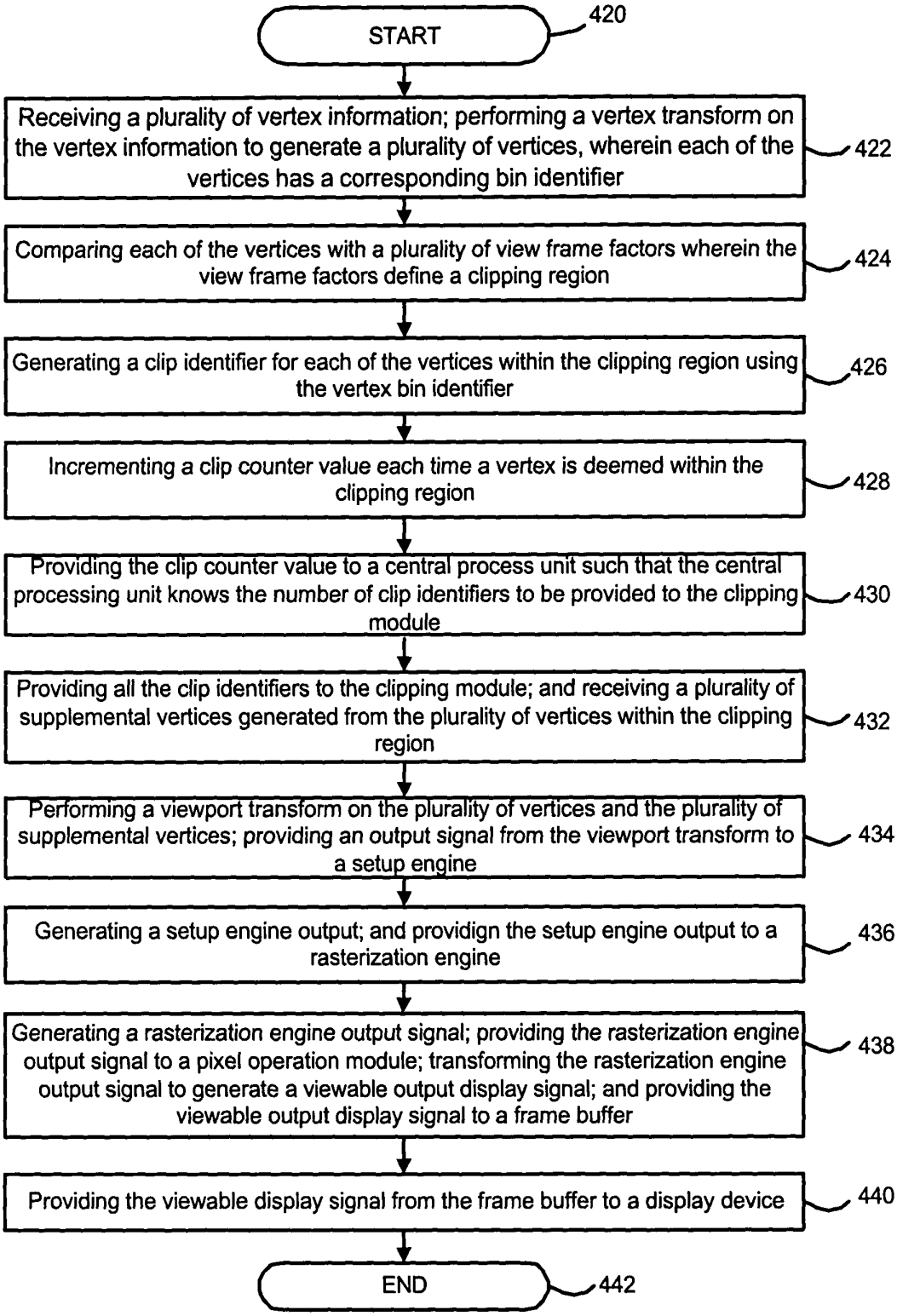
START
420
Receiving a plurality of vertex information; performing a vertex transform on the vertex information to generate a plurality of vertices, wherein each of the vertices has a corresponding bin identifier
422
Comparing each of the vertices with a plurality of view frame factors wherein the view frame factors define a clipping region
424
Generating a clip identifier for each of the vertices within the clipping region using the vertex bin identifier
426
Incrementing a clip counter value each time a vertex is deemed within the clipping region
428
Providing the clip counter value to a central process unit such that the central processing unit knows the number of clip identifiers to be provided to the clipping module
430
Providing all the clip identifiers to the clipping module; and receiving a plurality of supplemental vertices generated from the plurality of vertices within the clipping region
432
Performing a viewport transform on the plurality of vertices and the plurality of supplemental vertices; providing an output signal from the viewport transform to a setup engine
434
Generating a setup engine output; and providign the setup engine output to a rasterization engine
436
Generating a rasterization engine output signal; providing the rasterization engine output signal to a pixel operation module; transforming the rasterization engine output signal to generate a viewable output display signal; and providing the viewable output display signal to a frame buffer
438
Providing the viewable display signal from the frame buffer to a display device
440
END
442

FIG. 10

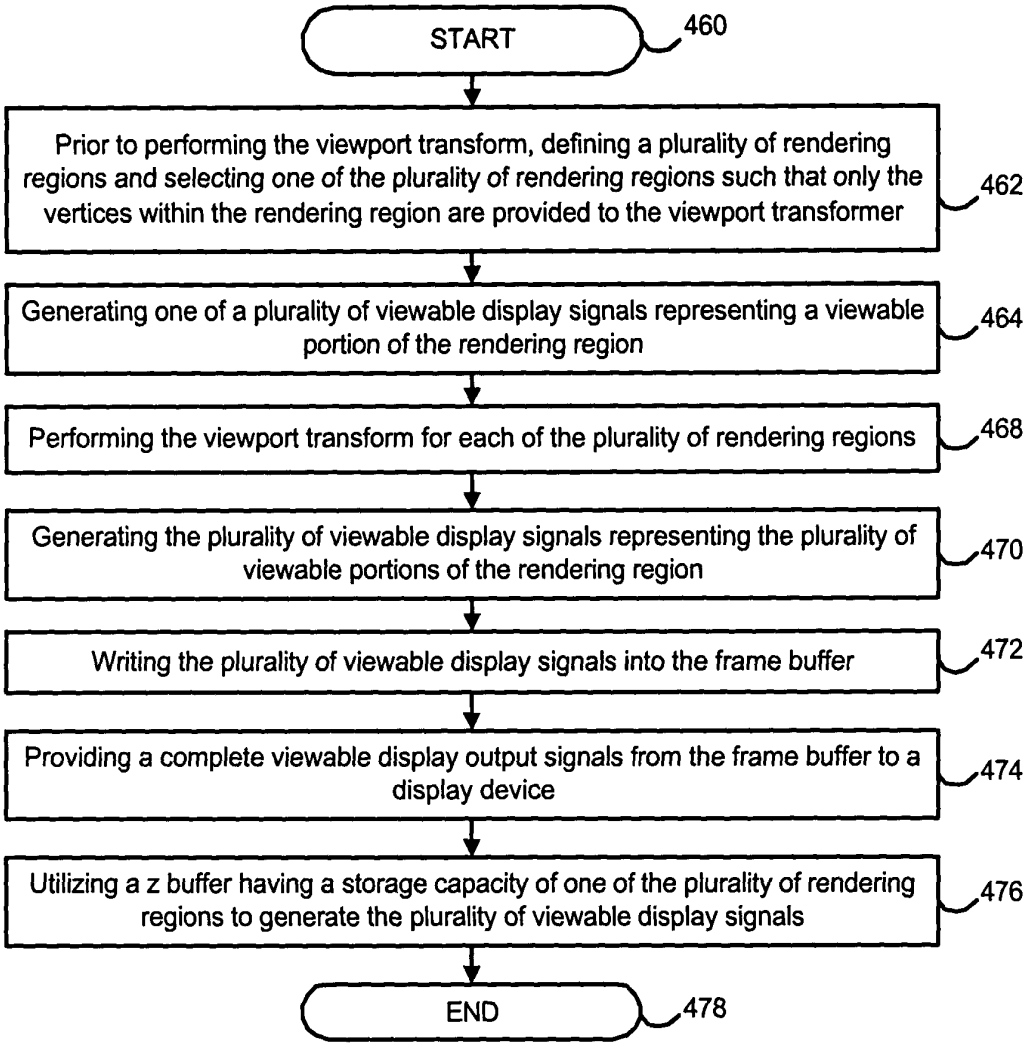
START
460
Prior to performing the viewport transform, defining a plurality of rendering regions and selecting one of the plurality of rendering regions such that only the vertices within the rendering region are provided to the viewport transformer
462
Generating one of a plurality of viewable display signals representing a viewable portion of the rendering region
464
Performing the viewport transform for each of the plurality of rendering regions
468
Generating the plurality of viewable display signals representing the plurality of viewable portions of the rendering region
470
Writing the plurality of viewable display signals into the frame buffer
472
Providing a complete viewable display output signals from the frame buffer to a display device
474
Utilizing a z buffer having a storage capacity of one of the plurality of rendering regions to generate the plurality of viewable display signals
476
END
478

FIG. 11

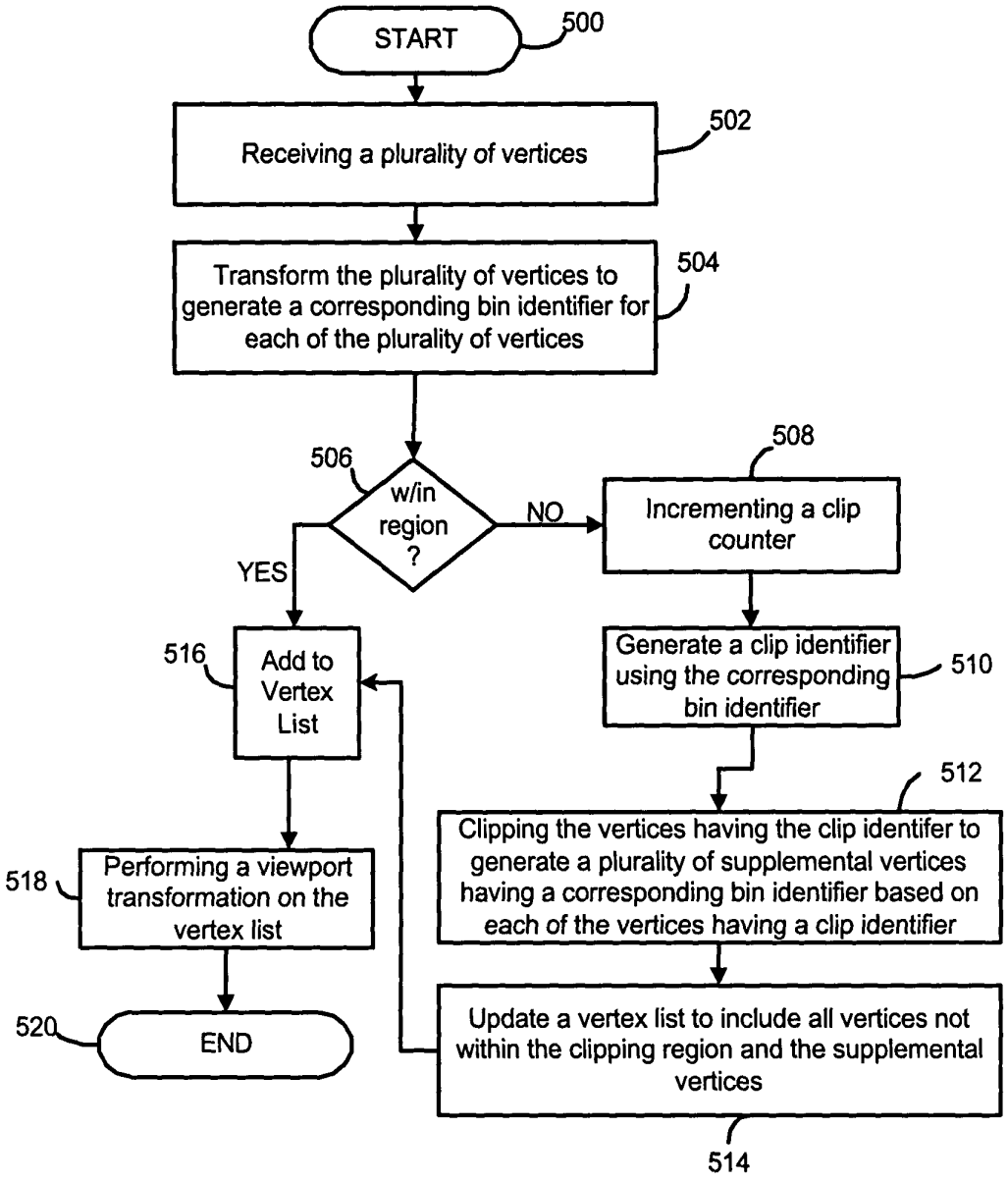
START
500
Receiving a plurality of vertices
502
Transform the plurality of vertices to generate a corresponding bin identifier for each of the plurality of vertices
504
506
w/in region ?
NO
YES
508
Incrementing a clip counter
Generate a clip identifier using the corresponding bin identifier
510
512
Clipping the vertices having the clip identifer to generate a plurality of supplemental vertices having a corresponding bin identifier based on each of the vertices having a clip identifier
Update a vertex list to include all vertices not within the clipping region and the supplemental vertices
514
516
Add to Vertex List
518
Performing a viewport transformation on the vertex list
520
END

FIG. 12